

***Asteroid Photometry***

Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, California 91109

**Alan W. Harris**

***Strategy***

Photoelectric lightcurves provide fundamental information about asteroids: rotation periods, pole orientations, shapes, and phase relations, which yield some information about the surface physical properties. This task is to carry on a program of such observations to increase the overall data base, obtain data on newly discovered asteroids, and to observe asteroids which are the subject of other complementary observations, such as occultations, radar, and IR.

***Progress and Accomplishments***

To date, approximately 1/3 of all known asteroid rotation periods and about 1/2 of all precision phase relations derive from TMO observations. A notable highlight this year was the demonstration, from high precision phase relation observations, that a three-parameter phase relation model is necessary to fit all asteroid phase relations. At a fundamental level, this means that the single- and multiple-scattering properties of asteroid surfaces differ from one to another, not just the ratio of single- vs multiple-scattering. Another accomplishment was the first use at TMO of a CCD camera for asteroid photometry, which enables us to follow up essentially all new asteroid discoveries, most of which are too faint for conventional photometry with the 24" telescope.

***Projected Accomplishments***

We propose to continue the asteroid program, with emphasis on measuring phase relations of low and high albedo asteroids at very low phase angles, collaborative observations in support of occultation and radar targets, and follow-up of newly discovered near-earth asteroids. An important new thrust will be to use a CCD camera, already available at TMO, for photometry of fainter asteroids. This will allow us to follow up essentially all newly discovered near-earth asteroids. A number of administrative and editorial duties will also be covered under this task: President of IAU Comm. 15, Chairman of Div. on Dynamical Astronomy of the AAS, Co-organizer of ACM 91 and Co-editor of its proceedings.

***Publications***

Harris, A.W., et al. Asteroid Lightcurve observations from 1981. *Icarus*, in press.

Harris, A.W., et al. (1990) Recent results from asteroid photometry. *Bul. Amer. Astron. Soc.* 22, 1112-1113.

Harris, A.W., et al. (1991) Photoelectric lightcurve and phase relation of 47 Aglaja. (Abstract, ACM 91 meeting).

Harris, A.W. (1991) High precision phase relations of dark, light, and intermediate asteroids. (Abstract, ACM 91 meeting).